

Desired Future Habitat Conditions In Pool 7, Mississippi River

Description of Pool 7

Pool 7 is an impoundment of the Mississippi River resulting from the construction of Lock and Dam 7 as part of the 9-foot channel navigation project. Construction of Lock and Dam 7 was completed in 1937. The Pool 7 area discussed in this report encompasses 58,000 acres, from approximately river mile 702 at Dakota, Minnesota, to river mile 714 near Trempealeau, Wisconsin.

In general, the landward boundaries of the Pool 7 planning area are the Canadian Pacific Railway railroad on the Minnesota side and the Burlington Northern Santa Fe railroad on the Wisconsin side of the Mississippi River. On the Minnesota side, the Mississippi River Valley is confined to a narrow bedrock gorge, which is a dominant feature of geomorphic reach 3. The interface between the river floodplain and bluffs is generally abrupt on the Minnesota side. On the Wisconsin side, the relatively flat sand terraces and the Black River Bottoms serve as a buffer between the Mississippi River and nearby bluffs. These terraces, known locally as Amsterdam Prairie and Brice Prairie, are undergoing rapid urbanization. The City of Onalaska, Wisconsin borders Pool 7 in the extreme southeastern corner of the pool.

Major tributaries to the Mississippi River within Pool 7 are the Black River (Wisconsin, river mile 709) and its distributaries Tank Creek (Wisconsin, river mile 712) and Shingle Creek (Wisconsin, river mile 710), and Halfway Creek (Wisconsin, river mile 706). The watersheds of these tributaries are predominantly agricultural. Increasing urbanization is also occurring in the Halfway Creek watershed and on the bluffs bordering the pool. Runoff from agricultural land and sites under construction contributes to significant loading of suspended sediment to the river. This sediment contributes to loss of depth diversity and decreased light penetration within the water column.

Typical of most navigation pools of the Upper Mississippi River, the water to land ratio changes from south to north. The lower reach of the pool is predominantly open water from river miles 702-708. This impounded area is known as Lake Onalaska. The Sommers Chute Delta, located on the west side of Lake Onalaska near river mile 706.5, is an important habitat feature. The amount of land increases in the middle portion of the pool, with more islands separated by multiple river channels and backwater wetlands. The delta of the Black River influences the water to land ratio in this section of the pool. The upper reach of Pool 7 includes several large islands located along the main channel, backwater lakes, and several large, shallow wetlands. Mud Lake and Big Marsh are examples of these shallow wetlands.

In 1983, Lake Onalaska contained more than 3,320 acres of wildcelery (*Vallisneria americana*) beds. Wildcelery beds provide habitat for panfish. While all parts of the plant are consumed by waterfowl, the winter buds and rootstocks are relished the most. Wildcelery plants also provide cover for the larvae of aquatic invertebrates, which are important foods for fish and waterfowl. Wildcelery beds in Lake Onalaska were affected by the drought that occurred in the late 1980's. By 1990, less than 300 acres of wildcelery beds were found on the lake. Beginning in 1994, the recovery of wildcelery beds began and continues today. Lake Onalaska also supports a variety of macroinvertebrates, including midges, burrowing mayflies, and fingernail clams. Densities of fingernail clams averaged nearly 2,000 per meter² in 1993. In 2000, the per average number

dropped to about 500 meter². Surveys of macroinvertebrates at selected sites in Lake Onalaska in 2000 found densities of zebra mussels approaching 5,000 per meter².

Description of Pool 7 Sub-Areas

Several identifiable areas are present within Pool 7. The boundaries of these areas can be roughly defined based on hydrologic units (i.e. main channel, tributary deltas or bluffs). The following areas have been delineated to facilitate presentation of desired future habitat conditions in the pool:

Upper Pool 7 - This diverse area is bounded on the north by Lock and Dam 6 and to the south by the Black River Delta. This area consists of many backwater lakes, including Long, Round, and the three lakes known as the Trempealeau Lakes. Also located within this area are Mud Lake and Big Marsh, which are large, shallow wetlands. In recent years, both Mud Lake and Big Marsh have supported dense beds of wild rice. Several large islands, surrounded by relatively deep channels, are located along the main channel.

Under the authority of the Environmental Management Program (EMP), a Habitat Rehabilitation and Enhancement Project (HREP) was completed at Long Lake in 2000. This 15-acre backwater lake is used by panfish as an overwintering site. A diversion channel, complete with a water control structure, was constructed to allow oxygenated water to flow into Long Lake to alleviate low dissolved oxygen levels in late summer and winter. The 2001 flood damaged the water control structure and channel and deposited an estimated 20,000 cubic yards of sand in Long Lake. Alternatives will be evaluated to recommend the next course of action for the project.

About 900 feet of shoreline along the main channel on Richmond Island was stabilized in 1997 by the U.S. Army Corps of Engineers to minimize further erosion and protect a small backwater bay located in the interior of the island. Additional bank stabilization is needed at several sites on islands located along the main channel. Portions of Mud Lake and Big Marsh are becoming degraded due to sedimentation.

Black River Bottoms and Delta - This 10,130-acre block of nearly contiguous bottomland forest, extending almost 10 miles up the Black River, is bounded by the Highway 53 bridge on the north and the delta on the south. The width of this area is sharply defined by the floodplain/terrace interface. Land ownership within this area includes a mixture of private and public land, both state and federal. Public land includes the Upper Mississippi River National Wildlife and Fish Refuge. The Van Loon Wildlife Management Area (WMA), owned and managed by the Wisconsin DNR, is located at the upper end of the Black River Bottoms. Browns Marsh is a backwater wetland located near the delta.

In the past 60 years, a number of habitat changes have taken place in the Black River Bottoms. Immediately after the lock and dam system went operational in the 1930's, a complex that included forest, wet meadows, terraced wetlands, flowing channels, and oxbow lakes dominated the landscape. Timber cutting, grazing, haying, fire, and farming were all used in varying degrees to manage sites within this area. In the years since, many of these practices were subsequently discontinued as landowners changed, farming operations were discontinued, or because sites became too wet due to hydrologic changes. Sedimentation continues to be a factor in the Black River Bottoms and Delta. Today, the bottomland forest is aging. The invasive plant, reed canarygrass, is present and may expand into formerly forested areas. Moreover, urbanization, moving north from the La Crosse/Onalaska Metropolitan Area, threatens to isolate the Bottoms.

A private/public partnership has formed and is interested in working together to protect the Black River Bottoms. Among the management tools available to this partnership include working with private landowners on wildlife habitat improvement projects, purchase of conservation easements, or fee title acquisition from willing sellers. Purchasing land from willing sellers within approved acquisition boundaries in both the Van Loon WMA and Upper Mississippi River National Wildlife and Fish Refuge has also been identified. Inventorying the forest within this complex, using the protocol established by foresters from the U.S. Army Corps of Engineers, is needed. There is also increased interest in this area because of the presence of the Eastern Massasauga rattlesnake, a candidate species under the federal Endangered Species Act.

Lake Onalaska Barrier Island Complex/Sommers Chute Delta - This buffer between the main channel and Lake Onalaska extends from the Black River Delta (river mile 709) south to Lock and Dam 7 (river mile 702.5). Many of the islands are forested. The main channel interface is abrupt; wetland complexes are found on the Gibbs Lake and Lake Onalaska sides of these barrier islands. Several chutes permit the flow of water from the main channel through this backwater complex. Among the chutes include Bullet, No Name, Gibbs, Goose, Sommers, Proudfoot, and Millers. Gibbs Chute south to Lock and Dam 7 is part of the Lake Onalaska Closed Area. During the 1999 fall migration, this important closed area supported nearly 6 million waterfowl use days. The majority of the total tundra swan/Canada goose/puddle duck use days, nearly 1,330,000, and portion of the nearly 3.6 million diving duck use days, occurred in the shadow of this barrier island complex, or on the Sommers Chute Delta. A nearly 450-acre delta is located at the mouth of Sommers Chute and provides habitat for a variety of fish and wildlife species. Increasing outflows from the main channel into Sommers Chute resulted in the construction of a closing structure in 1994 by the U.S. Army Corps of Engineers and their channel maintenance program. Since the completion of this closing structure, accretion of sand in the delta appears to have slowed. Rock liners were also placed in Gibbs, Goose, and Proudfoot Chutes as part of the Sommers Chute Project. Bullet and No Name Chutes were armoured through the channel maintenance program in 1989 as part of the Winters Landing Project.

One area where accretion is occurring along the barrier island complex is near Proudfoot Slough. This site is located on the river side of the barrier islands and just below Sommers Chute.

Because of the importance of these barrier islands in protecting wetland complexes, nearly 1400' of shoreline was protected in 1998 on Islands B and C located just upriver from Lock and Dam 7. The complex of three barrier islands at this location protects an estimated 200 acres of submersed aquatic plants, mainly wildcelery, in Lake Onalaska.

Dresbach Island/Island 91 Complex/Dakota Island - Dresbach Island is nearly 135-acres and was formerly a dredge spoil placement site. The Island 91 Complex consists of two islands, totalling nearly 19- acres. Dakota Island is currently a dredged spoil placement site. All three sites border the main channel; wetland complexes are associated with each site.

Habitat work was completed at Dresbach Island and the Island 91 Complex in 1997. The upper end of Island 91 was armoured to protect the wetland located within the horseshoe. At Dresbach Island, a portion of the sand placement site was restored by first adding fine material to the site, then planting trees. A seed island was also constructed at the upper end of Dresbach Island to help protect it. An opportunity exists on the eastern leg of Dresbach Island to complete additional habitat restoration.

Dakota Island is currently a dredged spoil placement site. However, the use of this site for that purpose may change in the future because of the demand for accessible sand. Rather than place sand in this inaccessible location, sand excavated through channel maintenance activities may be barged directly to the Hot Fish Shop Placement Site (river mile 713.1, Minnesota). If this scenario occurs, there may be an opportunity to restore habitat on part of Dakota Island.

Lake Onalaska - This nearly 7,400-acre backwater complex provides habitat that supports one of the premier centrarchid fisheries on the Upper Mississippi River. Further, Lake Onalaska provides excellent habitat for wildlife, including significant percentages of the continental population of canvasback ducks and tundra swans. With the exception of the southeast corner, much of Lake Onalaska is part of the 7,330-acre Lake Onalaska Closed Area. In an effort to minimize disturbance migrating waterfowl, the Lake Onalaska Voluntary Waterfowl Avoidance Area was established in 1986 and encompasses nearly 3,250 acres within the closed area. Red Oak Ridge Island (55 acres) and Rosebud Island (178 acres) are the two largest islands located on the lake. Several smaller islands are located in proximity to these two larger islands. Considerable habitat restoration work has been completed on Lake Onalaska in the past 15 years. Among the projects:

The Lake Onalaska EMP-HREP was completed in 1989-90. Sedimentation and aquatic plant growth had nearly eliminated water flow through a major centrarchid overwintering area, creating dissolved oxygen problems. Islands in Lake Onalaska had also eroded, leaving the lake subject to increased wave action and turbidity problems. Restoration included dredging parallel channels behind Rosebud Island to provide wintering panfish habitat. Three crescent-shaped islands were also constructed in the middle of Lake Onalaska. Aquatic plants, including wildcelery, grow in the shadow of each island and they also provide excellent mallard nesting habitat. A sediment trap was also dredged at the mouth of Halfway Creek. Material dredged from the habitat channels and not suitable for the Highway 53 project was pumped to containment basins on Rosebud Island. Reforesting part of the primary containment basin is a priority.

Water flow through the dredge channels has increased from minimal flow before the project to 600 feet per second (cfs) measured during the winter of 1992 and in subsequent winters. The project design was 100 cfs. Winter flows have been reduced through the dredge cuts by controlling the flow at the Onalaska Spillway.

In 1992 a breach that had developed at the tip of the Brice Prairie Barrier Island was repaired. This island was formed in the late 1960's from material removed during the dredging of the adjoining Brice Prairie Channel. The channel provides boat access to Lake Onalaska from the Brice Prairie Channel and also provides centrarchid wintering habitat.

Red Oak Ridge Island bank stabilization project was completed in 1995. This island is vegetated with high quality forest habitat containing hickory and oaks. Over time, wave erosion at both ends of the island resulted in significant loss of shoreline and forest. Rock mounds were constructed at each end of the island and have been successful in stabilizing the shorelines. Project funding was provided by the U.S. Army Corps of Engineers.

Additional habitat restoration work identified for Lake Onalaska and associated islands include bank stabilization on Bell Island and the smaller islands located in the southeastern corner of the lake; deepening the lower end of the Brice Prairie Channel for additional centrarchid habitat; island restoration in the upper end of the lake near Blackdeers Cut; and reforestation work on Rosebud Island.

A long-term schedule of water level management will also be evaluated for Lake Onalaska and Pool 7. If applicable, implemented to benefit shallow wetland habitat and other fish and wildlife habitat. This action will be done in cooperation with the public, industry, local units of government, and local, state, and federal agencies.

Halfway Creek/Sand Lake Coulee Creek Watersheds - These two watersheds are located in La Crosse County, Wisconsin and drain approximately 28,000 acres to Lake Onalaska. Much of the current land use in these watersheds is in agriculture and wooded; however, residential and commercial development is rapidly expanding. Flooding in 1993, and ongoing concerns with sedimentation prompted the Town of Onalaska in 1994 to evaluate causes and possible solutions to these watershed problems. This analysis documented current and projected sediment loads and stormwater runoff in the basin, and identified associated water quality impacts at Halfway Creek Marsh and Lake Onalaska. The resulting report also provided development density, stormwater, and sediment management recommendations. Land use planning and best management practices, both structural and nonstructural, are currently being implemented by partnerships involving individuals, landowners, organizations, local units of government, and state and federal agencies.

Implementation of the plan began with the construction of the Upper Halfway Creek Marsh Project in 1999. Among the goals of this project, completed in 2000, is to reduce the amount of sediment reaching Halfway Creek Marsh and Lake Onalaska. Toward that end, an inlet structure was constructed on Halfway Creek that will divert part of the flow into an upland sediment trap during high flow events. In the process, this sediment trap will also be managed as a moist soil unit, benefiting a variety of waterfowl, shorebirds, and other wetland-dependant wildlife. Two other impoundments, totalling nearly 56 acres, were constructed as part of this project and will be managed as temporary-seasonal wetlands.

Nearly 2,200 lineal feet of eroding streambanks on Halfway Creek were stabilized in 2000. This work was done on private land on sites identified as high priority. Additional bank stabilization is planned in the future.

Sediment detention basins have also been designed on Halfway Creek and Sand Lake Coulee Creeks as part of the overall effort.

In a related effort, a Stormwater Management Plan was developed in 1999 for Brice Prairie by the Town of Onalaska. The purpose of this plan is to develop stormwater management guidelines and policies to prevent flooding and environmental degradation. This effort was prompted by the development occurring on Brice Prairie and in the surrounding area.

Unique Attributes, Opportunities and Constraints

One opportunity is the considerable public interest in the environmental health and habitat quality of the pool, particularly Lake Onalaska and the Black River Bottoms. Private-public partnerships have resulted in a number of successful projects. Among the examples are the Lake Onalaska EMP Project, the Lake Onalaska Voluntary Waterfowl Avoidance Area Program, and watershed planning and implementation in the Halfway and Sand Lake Coulee Creek watersheds. There is also interest in doing additional work.

Lake Onalaska and the Black River Bottoms are unique attributes.

The Midway Railroad Prairie State Natural Area, located along the Great River State near the City of Onalaska, is owned by the U.S. Fish and Wildlife Service and managed as part of the Upper Mississippi River National Wildlife and Fish Refuge.

Summary of Potential Actions to Achieve Desired Future Habitat Conditions

Often the actions proposed and described below are interrelated and specific actions will require overlapping solutions. The goal of these actions is to increase diversity in Pool 7. This diversity may be biological, such as the number of fish or wildlife species affected, or may be reflected in habitat diversity, such as side channel reformation, acres of islands restored, or increased acres of emergent plants present. Increasing and sustaining a diverse aquatic and terrestrial habitat base in Pool 7 is the key to improving the health of the Mississippi River.

1.) Maintain existing quality habitat.

A key to the desired future is to protect and maintain existing terrestrial and aquatic habitat. Many areas in Pool 7 are considered as quality habitat for a variety of species. Maintenance of existing quality habitat may be as simple as leaving it alone and monitoring its condition. Specific actions would be identified if long-term declines in habitat quality in the area are noticed.

2.) Support watershed management programs.

Watershed management initiatives such as the Halfway Creek/Sand Lake Coulee Creek initiative should be exported to other tributaries, such as the Black River, to reduce sediment and nutrient inputs into the Mississippi River.

3.) Protect and restore islands.

A number of islands need protection. Among them are Bell Island, several small islands off Rosebud Island on Lake Onalaska, and islands located on or near the main channel in the upper end of the pool.

Island restoration projects have been recommended for the lower barrier island chain located above Lock and Dam 7 and for the upper end of Lake Onalaska. There may be other opportunities as well to breakup wind fetch on Lake Onalaska.

4.) Manage water levels to improve aquatic habitat.

Periodic drawdowns to increase light penetration and to consolidate bottom sediments may be used with the overall goal of increasing the abundance and distribution of emergent plants, particularly along the chain of barrier islands separating Lake Onalaska from the main channel.

5.) Work cooperatively with private property owners.

Private-public partnerships are needed for such tasks as to promote, acquire, and manage buffers around key features such as Brice Prairie, the Black River Bottoms, and the Trempealeau Lakes area. Assisting the Town of Onalaska in implementing the Brice Prairie Stormwater Management Plan is another opportunity. A variety of tools are available to acquire and manage these buffers,

including purchase of development rights, purchase of conservation easements, donations, and fee title acquisition from willing sellers.

6.) Manage river flows and connectivity to improve aquatic habitat.

Some of the best and most diverse habitat in the Upper Mississippi River System is associated with the mosaic of small flowing channels, chutes, sloughs, embayments, deltas, barrier islands, natural river levees, and associated plant communities. Flow regimes in a number of areas in Pool 7 have been altered by channel maintenance training structures. A review of all structures within Pool 7 should be completed to determine those that may be adjusted to make them more compatible with both wildlife and navigation needs.

7.) Increase depth diversity in channels and backwaters.

Projects may be implemented in selected backwaters to improve riverine and backwater communities. Among the tools that may be used are dredging, construction of closing structures, island restoration, shoreline stabilization, and improved connectivity.

8.) Manage floodplain forest and prairie communities for diversity and quality.

Terrestrial habitat maintenance and restoration may occur on the Black River Delta and the Black River Bottoms. Projects may include measures to reduce or manage the sediment being transported by the Black River; revegetation of former channel maintenance disposal sites; conversion of sites currently dominated by reed canarygrass to bottomland forest or prairie; and raising the elevations of landforms through the use of dredge material.